THE ASTROPHYSICAL JOURNAL

## THE UNIVERSITY OF CHICAGO PRESS CHICAGO, ILLINOIS

THE CAMBRIDGE UNIVERSITY PRESS LONDON

THE MARUZEN-KABUSHIKI-KAISHA
TOKYO, OSAKA, KYOTO, PUKUOKA, SENDAI
THE COMMERCIAL PRESS, LIMITED
SHANGHAI

### THE

# ASTROPHYSICAL JOURNAL

An International Review of Spectroscopy and Astronomical Physics

#### EDITORS

GEORGE E. HALE

Mount Wilson Observatory of the Carnegie

Institution of Washington

EDWIN B. FROST Yerkes Observatory of the University of Chicago

HENRY G. GALE
Ryerson Physical Laboratory of the
University of Chicago

#### COLLABORATORS

Walter S. Adams, Mount Wilson Observatory; Joseph S. Ames, Johns Hopkins University; Aristarch Belopolsky, Observatoire de Poulkova; William W. Campbell, Lick Observatory; Henry Crew, Northwestern University; Charles Fabry, Université de Paris, Alered Fowler, Imperial College, London; Charles S. Hastings, Yale University of Heinrich Kayser, Universitäl Bonn; Albert A. Michelson, University of Chicago; Hugh F. Newall, Cambridge University; †Carl Runge, Universität Göllingen; Henry N. Russell, Princelon University; Frank Schlesinger, Yale Observatory; Sir Arthur Schuster, Twyford

† Died January 3, 1927

VOLUME LXV

JANUARY-JUNE 1927



THE UNIVERSITY OF CHICAGO PRESS CHICAGO, ILLINOIS Published January, March, April, May, June, 1927

> Composed and Printed By The University of Chicago Press Chicago, Illinois, U.S.A.

astron. Obs. Wahr

## CONTENTS

NUMBER I	
MEASUREMENT OF THE VELOCITY OF LIGHT BETWEEN MOUNT WILSON AND MOUNT SAN ANTONIO. A. A. Michelson	PAGE
APPENDIX III. MEASUREMENT OF LENGTH OF LINE USED IN DETERMINA- TION OF VELOCITY OF LIGHT. William Bowie	14
STELLAR SPECTRA OF CLASS S. II. Paul W. Merrill	23
An Application of the Quantum Theory to the Luminosity of Diffuse Nebulae. H. Zanstra	50
Reviews:  Beobachtungen der Dämmerung und von Ringerscheinungen um die Sonne, 1911 bis 1917, C. Dorno (Oliver J. Lee), 71.—Himmelshelligkeit, Himmelspolarization, und Sonnenintensität in Davos, 1911 bis 1918, C. Dorno (Oliver J. Lee), 71.	
· ·	
NUMBER II	
A STUDY OF SOLAR MOTION BY HARMONIC ANALYSIS. J. J. Nassau and P. M. Morse	73
THE ELECTRIC-FURNACE SPECTRA OF YTTRIUM, ZIRCONIUM, AND LAN- THANUM. Arthur S. King and Edna Carter	86
THE ABSOLUTE MAGNITUDES OF GIANT M STARS. Gustaf Strömberg .	108
NOTE ON THE PHYSICAL THEORY OF METEORS. F. A. Lindemann	117
THE SHORT-PERIOD VARIABLE STAR RV CANUM VENATICORUM. J. Schilt	124
REVIEWS:  Elements of Astronomy, Edward A. Fath (W. H. Garrett), 130.—Die  Kultur der Gegenwart, Dritter Teil, Dritte Abteilung: PHYSIK,	
E. Lecher (ed.) (F), 131.—Fundamental Concepts of Physics, Paul R. Heyl (F), 132.—Amateur Telescope Making, Russell W. Porter (S.B.B.), 133.—Tabelle der Hauptlinien der Linienspektra aller Elemente, H. Kayser (George S. Monk), 133.—Practical Physics, T. G. Bedford (William W. Watson), 134.—X-Rays and Electrons, Arthur H. Compton (William Duane), 135.	,

## CONTENTS

NUMBER III	PAGE
PHOTOGRAPH OF THE ORION NEBULOSITIES. Frank E. Ross	137
A STUDY OF THE INFRA-RED SOLAR SPECTRUM WITH THE INTERFER- OMETER. Harold D. Babcock	
	140
Interstellar Calcium. Otto Struve	163
CARL RUNGE. Edwin B. Frost	200
The state of the s	
NUMBER IV	
STARK EFFECT FOR THE SPECTRA OF SILVER, COPPER, AND GOLD. Yoshio	
Fujioka and Sunao Nakamura	201
THE EXCITATION OF THE SPECTRA OF CARBON MONOXIDE BY ELECTRONIC	
IMPACTS. O. S. Duffendack and G. W. Fox	214
The Motions of Giant M Stars. Gustaf Strömberg	238
MINOR CONTRIBUTIONS AND NOTES  Note on Professor Ross's Paper Entitled: "Photographs of Mars, 1926," W. H. Wright, 266.—Comment on Professor Wright's Note, Frank E. Ross, 268.  REVIEWS:  Astronomy, John Charles Duncan (William O. Beal), 271.—Investigations on the Theory of the Brownian Movement, Albert Einstein (A. J. Dempster), 272.	
NUMBER V	
An Unusual Spectroscopic Binary (27 Canis Majoris). Otto Struve	273
STARS WHOSE SPECTRA HAVE BRIGHT IRON LINES. Paul W. Merrill .  SPECTROGRAPHIC ORBITS OF THE TWO COMPONENTS OF BOSS 5683.	286
Roscoe F. Sanford	295
ORBIT OF THE SPECTROSCOPIC BINARY 36 79 ERIDANI. O. Struve and	
C. Hujer	300
INFLUENCE OF ATMOSPHERIC CONDITIONS ON THE EFFECTIVE WAVE- LENGTHS OF STARS. Richard A. Robb	315
REVIEWS:	3-3
Linienspektren und periodisches System der Elemente, Friedrich Hund (Frank C. Hoyt), 321.—Proceedings of the Optical Convention 1926 (G. W. Moffitt), 322.—Traité de Physique, O. D. Chwolson (A. Pogo), 323.	
INDEX	326